

# Printing and Publishing

(SIC 27)

## SIGNIFICANT POINTS

- Over 22 percent of the jobs in the industry were in managerial and professional occupations, a higher proportion than any other manufacturing industry.
- Most firms are small, employing fewer than 10 people.
- Computerization is changing or eliminating occupations.

### Nature of the Industry

The printing and publishing industry produces products ranging from newspapers, magazines, and books to brochures, labels, newsletters, postcards, memo pads, business order forms, checks, maps, and even T-shirts.

This industry includes a number of segments (table 1). Commercial printing establishments, which print newspaper inserts, catalogs, pamphlets, and advertisements, make up the largest segment of the industry, accounting for 40 percent of employment and 55 percent of total establishments. Newspapers are the next largest sector, with 26 percent of industry employment. The greeting card segment is the smallest, accounting for only 1.4 percent of employment and 0.2 percent of total establishments.

Printing and publishing is a large industry composed of many shops, varying in size. Almost 7 of every 10 printing shops comprising the industry employ 10 or fewer workers (chart). These small printing shops are often referred to as "job shops," because what they print is determined by the jobs customers need to have printed.

**Table 1. Establishments and wage and salary employment in printing and publishing by detailed industry, 1997**

	Establishments	Employment
Total .....	62,577	1,501,714
<b>Printing</b>		
Commercial printing .....	34,223	597,828
Blankbooks and bookbinding .....	1,712	64,900
Book printing .....	776	52,709
Manifold business forms .....	924	44,019
Typesetting .....	2,057	26,114
Platemaking services .....	1,301	25,203
<b>Publishing</b>		
Newspapers .....	8,749	393,590
Periodicals .....	6,245	119,607
Book publishing .....	2,954	88,881
Miscellaneous publishing .....	3,358	67,365
Greeting cards .....	156	21,422

SOURCE: U.S. Department of Commerce, *County Business Patterns*, 1997

There are five printing methods that use plates or some other form of image carrier: lithography, letterpress, flexography, gravure, and screen printing. Plateless or nonimpact processes such as electronic, electrostatic, or inkjet printing, are mainly used for copying, duplicating, and specialty printing, usually in quick or in-house print shops.

Lithography, which uses the basic principle that water repels oil, remains the dominant printing process in the industry, accounting for most of it. Lithography lends itself to computer composition and the economical use of color, accounting for its dominance. In the future, flexography and gravure are expected to be more widely used. Flexography produces vibrant colors with little ruboff, qualities valued for newspapers, directories, and books, which are its biggest markets. Gravure's high quality reproduction, flexible pagination and formats, and consistent print quality has won it a significant share of packaging and product printing and a growing share of periodical printing. In response to environmental concerns, printers increasingly use alcohol-free solutions, water-based inks, and recycled paper.

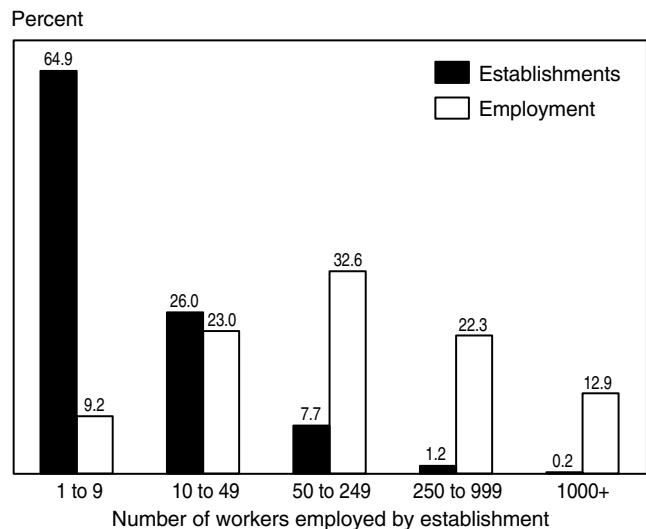
The printing industry, like many other industries, continues undergoing technological change, as computers and technology alter the manner in which work is performed. Many of the processes that were once done by hand are becoming more automated. Technology's influence can be seen in all three stages of printing: *prepress*, preparation of materials for printing; *press*, the actual printing process; and *post-press* or *finishing*, the folding, binding, and trimming of printed sheets into final form. The most notable changes are occurring in the prepress stage. Instead of cutting and pasting articles by hand, it is now common to produce an entire publication on a computer, complete with artwork and graphics. Columns can be displayed and arranged on the computer screen exactly as they will appear in print, and then printed. Nearly all prepress work is expected to be computerized by 2008, and workers will need more training in electronics, computers, and mathematics.

Many segments of the publishing industry produce their products electronically. For example, many periodicals, books, and promotional materials can be found on the Internet, on CD-ROM, and on audio and video tapes. This expansion into nonprint media is expected to continue as the Internet heralds a new era in the printing and publishing industry. Individuals are now designing their own work on the World Wide Web and, consequently, have a reader base of millions. As a result, the market for the design and development of Internet pages and publications is growing significantly.

### Working Conditions

The average nonsupervisory worker in the printing industry worked approximately 38.3 hours per week in 1998, compared to 41.7 hours per week across all manufacturing industries. Workers in the industry generally put in an 8-hour day, but overtime often is required to meet publication deadlines. Some

### Nearly two-thirds of establishments in printing and publishing employ fewer than 10 workers



Source: U.S. Department of Commerce, *County Business Patterns*, 1997

employees, particularly those employed by newspapers, work nights, weekends, and holidays. Larger companies tend to have shift work. There is a fair amount of flexibility with shift schedules and overtime, which is largely based on seniority.

Working conditions vary by occupation. For example, press operators work in noisy environments and often wear ear protectors. On the other hand, typesetters and compositors usually work in quiet, clean, air-conditioned offices. Most printing work involves dealing with fine detail, which can be tiring both mentally and physically. Fortunately, with the advanced technology in machinery, there is not as much strain on the eyes as in the past.

Even with more safety enhanced machinery, some workers are still subject to occupational hazards. Platemakers, for example, may work with toxic chemicals that can cause skin irritations, and press operators work with rapidly moving machinery that can cause injuries. In 1997, work-related injuries and illnesses were 5.7 per 100 full-time workers, much lower than the 10.3 percent rate for manufacturing as a whole. Blankbooks, such as ledgers and notebooks, and bookbinding had the highest incidence of injury and illness, with 7.7 cases per 100 full-time employees. In recent years, however, the working environment has become less hazardous as the industry has become more automated. Also, companies are using fewer chemicals and solutions than in the past and are experiencing fewer equipment-related accidents.

### Employment

In 1998, the printing and publishing industry had about 1.6 million wage and salary jobs in addition to 125,000 self-employed workers, ranking it among the largest manufacturing industries. Nearly two-thirds of wage and salary jobs were in establishments employing less than 10 workers (chart); nearly 70 percent were in the two largest sectors: commercial printing and newspapers (table 1). Printing plants are widely dispersed throughout the country; however, more specialized types of printing tend to be regionally concentrated. For example, financial printing is concentrated in New York City.

### Occupations in the Industry

Printing and publishing occupations range from writers, editors, and sales workers to specialized production occupations rarely found in other industries (table 2). The printing sectors that perform press preparation or printing and binding work, such as commercial printing plants, blankbook and bookbinding shops, and printing trade services account for the majority of specialized printing occupations.

Specialized printing occupations comprise 25 percent of industry employment and are located in the prepress, press, and binding or post-press stages of printing. Almost all jobs in the printing industry require at least a high school education. Additional training and cross training is becoming increasingly necessary as the industry continues to automate. It often is beneficial to receive training in mathematics, electronics, and computers.

Prepress printing workers—including *typesetting* and *composing machine operators*, and *photoengraving* and *lithographic machine operators*—prepare material for printing presses. Included among their tasks are composing text, designing page layout, photographing text and pictures, and making printing plates. *Precision compositors* and *typesetters* set up and arrange type by hand or by computer into a galley for printing. *Job printers* set type according to copy, read proof copy for errors and clarity, and correct mistakes. *Desktop publishing specialists*, using a computer screen, call up type and art elements to arrange them into a completed page. The page is then transmitted into film or directly into plates for production.

*Camera operators*—who are classified as line camera operators, halftone operators, or color separation photographers—start the process of making a lithographic plate by photographing and developing negatives of the material to be printed. *Scanner operators* employ electronic or computerized scanning equipment to produce and screen film separations of photographs or art to use in lithographic printing plates. Operators review all work and adjust the equipment if they need to make corrections to the original. *Lithographic dot etchers* retouch negatives by sharpening or reshaping the images on the negatives. They work by hand, using chemicals, dyes, and special tools. *Film strippers* cut the film to required size and arrange and tape the pieces of negatives onto “flats,” or layout sheets, used to make press plates. *Platemakers* produce printing plates by exposing sensitized metal sheets to special light through a photographic negative. Some platemakers operate machines that process the plates automatically. In letterpress and gravure printing, *photoengravers* photograph copy, develop negatives, and prepare photosensitized metal plates for use.

When the material is ready, *printing press operators* install and adjust the printing plate, mix fountain solution, adjust pressure, ink the presses, load paper, and adjust the presses to paper size. Operators must also correct any problems that might occur during a press run.

Technology is rapidly changing the nature of many traditional press and prepress occupations. Manual film handling is quickly becoming the exception rather than the rule. Typesetters, platemakers, paste up workers, and film strippers are being replaced with workers who have mastered desktop publishing and the electronic aspects of the various printing processes. Where a camera negative was used in the past to produce plates of images, those images are increasingly being recorded by computerized photographic devices.

**Table 2. Employment of wage and salary workers in printing and publishing by occupation, 1998 and projected change, 1998-2008**

(Employment in thousands)

Occupation	1998		1998-2008 Percent change
	Number	Percent	
<b>All occupations</b> .....	1,565	100.0	-1.3
<b>Operators, fabricators, and laborers</b> ...	497	31.8	-2.7
Helpers, laborers, and material movers, hand .....	107	6.8	-0.4
Printing press machine setters, operators and tenders .....	80	5.1	3.1
Bindery machine operators and set-up operators .....	72	4.6	6.0
Offset lithographic press operators ...	57	3.6	-16.0
Truck drivers .....	42	2.7	-5.7
Hand workers, including assemblers and fabricators .....	32	2.0	2.2
Typesetting and composing machine operators and tenders .....	13	0.8	-60.1
Letterpress operators .....	10	0.6	-18.1
<b>Administrative support, including</b>			
<b>clerical</b> .....	318	20.3	-8.4
Office clerks, general .....	35	2.2	2.9
Bookkeeping, accounting, and auditing clerks .....	29	1.8	-17.4
Office and administrative support supervisors and managers .....	23	1.5	.4
Shipping, receiving, and traffic clerks .....	21	1.4	-3.0
Secretaries .....	20	1.3	-17.7
Order clerks .....	19	1.2	-6.3
Adjustment clerks .....	17	1.1	13.0
Data entry keyers .....	16	1.0	-18.2
Receptionists and information clerks .....	16	1.0	.9
Duplicating, mail, and other office machine operators .....	16	1.0	-12.6
<b>Precision production, craft, and</b>			
<b>repair</b> .....	209	13.3	-1.3
Blue collar worker supervisors .....	44	2.8	1.8
Desktop publishing specialists .....	25	1.6	71.0
Film strippers, printing .....	23	1.4	-33.1
Job printers .....	16	1.0	3.8
Platemakers .....	14	0.9	-5.4
Paste-up workers .....	9	0.6	-51.3
Compositors and typesetters, precision .....	8	0.5	-40.4
Camera operators .....	7	0.5	-34.7
Bookbinders .....	5	0.4	-16.1
<b>Professional specialty</b> .....	192	12.3	13.4
Writers and editors .....	70	4.5	19.3
News analysts, reporters and correspondents .....	38	2.4	-7.1
Artists and commercial artists .....	32	2.0	22.8
Computer systems analysts, engineers, and specialists .....	16	1.0	4.1
<b>Marketing and sales</b> .....	165	10.6	.2
All other sales and related workers ..	141	9.0	9.2
Marketing and sales worker supervisors .....	21	1.4	-.1
<b>Executive, managerial, and</b>			
<b>administrative</b> .....	157	10.1	.2
General managers and top executives .....	56	3.6	-.5
Management support occupations ....	32	2.1	3.4
Marketing, advertising, and public relations managers .....	21	1.4	2.3
<b>All other occupations</b> .....	26	1.6	-13.8

Pre-flight technicians examine and edit the work of desktop publishers. They ensure that the design, format, settings, quality and all other aspects of the automated desktop work are acceptable, and the finished product is completed according to the client's specifications before it is delivered.

During the binding or post-press stage, the printed sheets are transformed into products such as books, catalogs, magazines, or directories. *Bookbinders* assemble books from large, flat, printed sheets of paper. They cut, saw, and glue parts to bind new books and perform other finishing operations, such as decorating and lettering, often using hand tools.

A small number of bookbinders work in hand binderies. These highly skilled workers design original or special bindings for publications with limited editions, or restore and re-bind rare books. In many shops, *bindery workers* do much of the work. They fasten sheets or signatures together using a machine stapler and feed signatures into various machines for stitching, folding, or gluing.

In addition to these specialized printing occupations, administrative support workers, including clerical personnel, marketing and sales workers, professional specialty occupations, and managers are also employed in significant numbers in the printing and publishing industry. One occupation becoming more common is customer service representative, who tracks the various processes of production and acts as liaison between clients and technicians. The representative ensures the customer's satisfaction with the timely delivery of a high quality product.

Establishments engaged in publishing newspapers, periodicals, books, and other miscellaneous items employ the greatest numbers of professional specialty occupations, particularly reporters, writers, editors, artists, and marketing and sales occupations. These positions usually require a college education.

News analysts, reporters, and correspondents gather information and prepare stories that inform us about local, State, National, and international events. They collect and analyze facts about events by interview, investigation, or observation and write stories for newspapers and magazines. *Writers* develop fiction and nonfiction for books, magazines, trade journals, and newspapers. *Editors* supervise writers and select, plan, and prepare the contents of books, magazines, or newspapers. *Graphic artists* use a variety of print and film media to create and execute art that meets a client's needs. They increasingly use computers to lay out and test various designs, patterns, and colors before printing a final design. Finally, *marketing and sales workers* promote and sell a printer's or publisher's product.

### Training and Advancement

Workers enter the industry with various educational backgrounds. In general, job applicants must be high school graduates with mathematical, verbal, and written communication skills, and be computer literate.

Helpers generally have a high school or vocational school background, and management trainees may have a college background. Formal graphic arts programs, offered by community and junior colleges and some 4-year colleges, provide an introduction to the industry. Training in desktop publishing is particularly useful. Bachelor's degree programs in graphic arts prepare persons who may want to enter management, and 2-year programs provide technical skills. A

bachelor's degree in journalism, communications, or English provides a good background for those wishing to become reporters or writers. Experience on school newspapers and internships with news organizations are also beneficial.

As the industry continues to become more computerized, most workers will need a working knowledge of computers. Courses in electronics and computers are beneficial for anyone entering the industry, and some employers will offer tuition assistance or continuing education classes.

In the past, apprenticeships were quite common for specialized printing occupations. Now, workers are usually trained informally on the job. Hand bookbinders are one exception. These workers usually need a 4-year apprenticeship to learn the craft of restoring rare books and producing valuable collector items.

The length of on-the-job training needed to learn skills varies by occupation, and shop. For example, press operators begin as helpers and advance to press operators after years of training. Bindery workers begin by doing simple tasks such as moving paper from cutting machines to folding machines. Workers learn how to operate more complicated machinery within a few months. Training often is given under the close supervision of an experienced or senior employee. Through experience and training, workers may advance to more responsible positions. Workers usually begin as helpers, advance to skilled craft jobs, and may eventually be promoted to supervisor. Reporters and writers may advance to editors or supervising reporters.

Opportunities for advancement depend on the specific plant or shop. Technological changes will continue to introduce new types of computerized equipment or dictate new work procedures, and retraining will be essential to careers in printing and publishing.

## Earnings

In 1998, average weekly earnings for production workers in the printing and publishing industry were \$515, compared to \$563 for all production workers in manufacturing. As shown in table 3, weekly wages in the printing and publishing industry ranged from \$414 in blankbooks and bookbinding, to \$671 in printing trade services.

The principal union in this industry is the Graphic Communications International Union. About 9.8 percent of employees are union members or are covered by a union contract, compared to 15.4 percent of workers throughout the economy, but this proportion varies greatly from city to city.

## Outlook

Automation and shifting consumer demand are significantly affecting the printing and publishing industry. Employment is projected to decline 1 percent over the 1998 to 2008 period, compared to the 15 percent growth projected for the economy as a whole. This decline reflects competition from nonprint media, such as the Internet, and increasing use of nontraditional printing technologies. Nonetheless, predictions that computers will one day turn us into a paperless society have not yet come true. The printing industry will continue to supply products for education, business, and leisure for a long time to come. Although technological innovation and automation, mergers and acquisitions of small to medium-size printing firms, and partnering services offered among print-

ing firms will result in fewer jobs, certain sectors of the industry will experience growth.

**Table 3. Median hourly earnings of the largest occupations in printing and publishing, 1997**

Occupation	Printing and publishing	All industries
General managers and top executives ...	\$30.19	\$26.05
Sales representatives, except retail and scientific and related products and services .....	17.38	16.54
Writers and editors .....	15.07	15.69
Offset lithographic press setters and set-up operators .....	14.55	14.37
Sales agents, advertising .....	13.24	14.16
Printing press machine operators and tenders .....	12.56	12.09
Reporters and correspondents .....	10.94	11.23
Bindery machine operators and tenders .....	9.69	9.02
Machine feeders and offbearers .....	8.80	8.69
Hand packers and packagers .....	7.37	6.90

Employment in printing trade services is expected to decline because more companies are preparing printing and post-press in-house. Employment in newspapers is also expected to decline as more people choose to receive their news from non-print sources. Newspapers will also continue to face strong competition for advertising dollars from direct-mail advertising, which targets specific types of consumers in a more cost-effective manner. Many newspapers are responding by featuring specialized products and services for niche markets.

Slow employment growth is expected in periodicals, spurred by increasing interest in professional, scientific, and technical journals, as well as special interest publications, such as health and fitness magazines. Similarly, employment in book publishing and greeting cards should also see slow growth, spurred by an increasing and aging population.

Employment in miscellaneous publishing is expected to grow slowly. The popularity of catalogs and mail order shopping fuel this sector. However, increased paper costs, consumer preferences, and the growth of on-line catalogs will result in fewer jobs than in years past.

Employment growth will differ among the various occupations in the printing and publishing industry, largely due to technological advances. Processes currently performed manually will be automated in the future, causing a shift from craft occupations to related occupations that perform the same function using electronic equipment. For example, employment of desktop publishing specialists is expected to increase much faster than average as the elements of print production, including layout, design, and printing, are increasingly performed electronically. In contrast, demand for workers who perform these tasks manually, including paste-up workers, photoengravers, camera operators, film strippers, and plate-makers, is expected to decline.

With increasing use of computers that do typesetting and composing electronically, the number of typesetting and

composing machine operators will decline sharply. Declines among precision typesetters and compositors will occur in the newspaper industry, because news analysts and editors can perform these tasks themselves. Of other prepress occupations, job printers, desktop publishers, and other printing workers who perform a variety of printing tasks, are expected to experience growth.

Employment of press operators is expected to decline. Employment of offset press operators and letterpress operators should decrease rapidly. Employment of bookbinders will decline in response to the growth of electronic printing; however, bindery machine operators will increase.

As the industry continues to modernize, a greater diversity of workers will be needed, including engineers, marketing specialists, graphic artists, and computer specialists. New equipment will require workers to update their skills to remain competitive in the job market. For example, paste-up workers will have to learn how to lay out pages using a computer. The concepts and principles behind page layout and design are the same, but the workers will have to learn how to perform their work using different tools. Employment of marketing and sales workers in the printing and publishing industry is expected to experience little to no growth as a result of increased competition from nonprint media and advances in printing technologies.

### **Sources of Additional Information**

Information on apprenticeships and other training opportunities may be obtained from local employers such as newspapers and printing shops, local offices of the Graphic

Communications International Union, local affiliates of the Printing Industries of America, or local offices of the State employment service.

For general information on careers and training programs in printing, contact:

- Education Council of the Graphic Arts Industry, 1899 Preston White Dr., Reston, VA 20191.  
Internet: <http://www.npes.org>
- The Graphic Arts Technical Foundation, 200 Deer Run Rd., Sewickley, PA 15143.  
Internet: <http://www.gatf.org>
- Graphic Communications International Union, 1900 L St. NW., Washington, DC 20036.  
Internet: <http://www.gciu.org>
- National Association of Printers and Lithographers, 75 W. Century Rd., Paramus, NJ 07652.  
Internet: <http://www.napl.org>
- Printing Industries of America, Inc., 100 Dangerfield Rd., Alexandria, VA 22314.  
Internet: <http://www.printing.org>

Information on most occupations in the printing and publishing industry, including the following, may be found in the 2000-01 *Occupational Outlook Handbook*:

- Artists and commercial artists
- Bindery workers
- News analysts, reporters, and correspondents
- Prepress workers
- Printing press operators
- Writers and editors, including technical writers